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PATENT ABSTRACTS OF JAPAN

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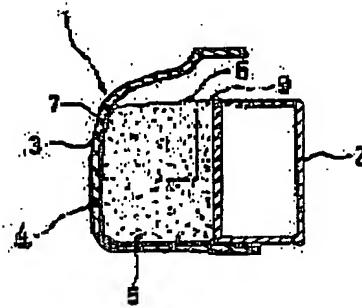
(72) Inventor : FUJIMOTO NAOYA

(54) BUMPER FOR AUTOMOBILE

(57) Abstract:

PROBLEM TO BE SOLVED: To provide a bumper for an automobile which can realize both leg part protection of a pedestrian and car body protection in case of collision against a wall and against a vehicle.

SOLUTION: A collision energy absorber 4 arranged between a front part of a bumper armature 2 and a bumper fascia 3 is provided with a lower side block 5 and on its top, an upper side block 6 constituted by arranging in a row a plurality of separators 7 with suitable spaces in a car width direction. Consequently, in case of collision against a leg part of a pedestrian, the leg part is advanced between the separators 7, 7, by deflection deformation thereof in a car width direction, increasing of reaction force is suppressed, collision energy is absorbed by only the lower side block 5. In case of collision against a wall, both the upper/lower side blocks 5, 6 are compression deformed in a longitudinal direction to increase a collision energy absorbing amount.



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DETAILED DESCRIPTION

[Detailed Description of the Invention]

[0001]

[The technical field to which invention belongs] This invention relates to the bumper for automobiles.

[0002]

[Description of the Prior Art] In the bumper for automobiles, what arranged in the cross direction of a bumper the collision energy-absorbing object which consists of elastic material, such as urethane foam, between the anterior part of a bumper armature and bumper FEISHA which consists of elastic material which covers this bumper armature, such as rubber and synthetic resin, at the whole abbreviation target is known as shown in JP,5-85286,A.

[0003]

[Problem(s) to be Solved by the Invention] As a pedestrian's cure against leg protection, it corresponds to a pedestrian's leg height. Said collision energy-absorbing object Although it is desirable to arrange in the space section bottom between bumper FEISHA and bumper armature anterior part In this case, the amounts of collision energy-absorbing run short at the time of the collision of an opposite wall, pair vehicles, etc. On the contrary, when a collision energy-absorbing object is arranged in the whole abbreviation for said space section as a cure against body protection at the time of the collision of an opposite wall, pair vehicles, etc., the conflict-technical problem that the standup of the initial load at the time of a collision will be it is large and disadvantageous as a pedestrian's cure against leg protection occurs.

[0004] Then, this invention offers the bumper for automobiles which can aim at coexistence with leg protection of a pedestrian and the body protection at the time of the collision of an opposite wall, pair vehicles, etc.

[0005]

[Means for Solving the Problem] If it is in invention of claim 1, it is characterized by to constitute said collision energy-absorbing object from a bottom block which extends on the whole abbreviation target at the cross direction of a bumper, and a bottom block which is on this bottom block, and successive-installation arrangement is carried out at a gap proper to the cross direction, bends in the cross direction, respectively, and consist of two or more deformable segregants in the bumper structure which arranged a collision energy-absorbing object between anterior part of a bumper armature, and bumper FEISHA.

[0006] If it is in invention of claim 2, it is characterized by for a bottom block according to claim 1 preparing a slit in the vertical direction, and forming two or more segregants successively to one, and having fabricated it.

[0007] If it is in invention of claim 3, it is characterized by having fabricated a bottom block given in claims 1 and 2 to a bottom block and one.

[0008] If it is in Invention of claim 4, it is characterized by having dissociated in the vertical direction and fabricating a segregant of a bottom block according to claim 3 and a bottom block through a slit.

[0009] If it is in invention of claim 5, it is characterized by forming successively segregants of a bottom block according to claim 3 and a bottom block in the vertical direction through a cervix

of thin meat.

[0010] If it is in invention of claim 6, it is characterized by having established a slant face in the side of a point of each segregant of a bottom block according to claim 1 to 5, and expanding a gap between points of each adjoining segregant.

[0011] If it is in invention of claim 7, a slant face of the point side of a segregant according to claim 6 is characterized by fabricating and forming a point of this segregant in plane Yamagata.

[0012] If it is in invention of claim 8, a slant face of the point side of a segregant according to claim 6 is characterized by having fabricated a point of this segregant in the shape of a plane circle, and forming it.

[0013]

[Effect of the Invention] According to invention according to claim 1, the bottom block formed on the bottom block of a collision energy-absorbing object Since successive installation arrangement of two or more segregants is carried out at a gap proper to the cross direction, and each segregant bends in the cross direction, respectively and is made into deformable structure When a bumper collides with a pedestrian's leg, in the portion corresponding to a pedestrian's leg An adjoining segregant bends and deforms in the direction estranged mutually to the cross direction, and penetration of the leg of a between [these segregants] is permitted. the reaction force of a bottom block — **** — it can stop small, only a bottom block can carry out a compression set, and collision energy can be absorbed now, consequently the standup of the initial load of a collision can be suppressed low, and a pedestrian's leg can be protected.

[0014] Moreover, if impacting vehicle force inputs into the large area of the front face of bumper FEISHA like [at the time of the collision of an opposite wall, pair vehicles, etc.] While coming to carry out the compression set also of each segregant of a bottom block to a cross direction with the bottom block of a collision energy-absorbing object, consequently enlarging the standup of the initial load of a collision Since collision energy is absorbed with these bottom block and a bottom block, the amount of collision energy-absorbing can be increased and the body and both the collision body can be protected.

[0015] According to Invention according to claim 2, since in addition to the effect of the invention of claim 1 a bottom block prepares a slit in the vertical direction, two or more segregants are formed successively to one and it has fabricated, successive installation arrangement of the segregant can be easily carried out tidily on a bottom block.

[0016] According to invention according to claim 3, since the bottom block is fabricated to a bottom block and one in addition to the effect of the invention of claims 1 and 2, components mark and an activity man day with a group do not increase, and it can obtain advantageously in cost.

[0017] Since each segregant of a bottom block is estranged in the vertical direction through a slit to a bottom block in addition to the effect of the invention of claim 3, the bending deformation to the cross direction of the segregant at the time of a pedestrian's leg protective action can be made to perform freely according to invention according to claim 4.

[0018] according to invention according to claim 5 — the effect of the invention of claim 3 — in addition, since each segregants of a bottom block are formed successively in the vertical direction through the cervix of thin meat to the bottom block, a cervix is flexible at the time of a pedestrian's leg protective action — it can fall and deformation can be made to perform bending deformation to the cross direction of a segregant freely

[0019] Moreover, since segregants are formed successively to the bottom block through the cervix, the tip side of this segregant curves upwards, and cannot escape, and the compression set of them can be carried out to a cross direction proper, and they can make a collision energy-absorbing operation perform at the time of the collision of an opposite wall, pair vehicles, etc.

[0020] Since according to invention according to claim 6 in addition to the effect of the invention of claims 1-5 a slant face is established in the point side of each segregant of a bottom block and the gap between the points of each adjoining segregant is expanded, penetration of a between [the segregants of this leg at the time of a pedestrian's leg protective action] is performed smoothly, and can make reaction force still smaller.

[0021] According to invention according to claim 7, since the slant face of the point side of a segregant fabricates the point of this segregant to plane Yamagata in addition to the effect of the invention of claim 6 and it has formed, the gap between the adjoining segregant points can be made large as much as possible.

[0022] Since the slant face of the point side of a segregant fabricates the point of this segregant in the shape of a plane circle In addition to the effect of the invention of claim 6 and it has formed, while being able to make the gap between the adjoining segregant points large as much as possible according to invention according to claim 8, the penetration guide of the leg can be smoothly carried out to between the segregants which adjoin even when a pedestrian's leg collides at the tip of a segregant.

[0023]

[Embodiment of the Invention] Hereafter, the operation gestalt of this invention is explained in full detail with a drawing.

[0024] In drawing 1 -3, 1 showed the front bumper as a bumper, and this front bumper 1 is equipped with the collision energy-absorbing object 4 arranged between the anterior part of these bumper armature 2, and bumper FEISHA 3 while it is equipped with bumper FEISHA 3 which consists of elastic material which covers the metal bumper armature 2 and this metal bumper armature 2 of a rectangular closed section, such as rubber and synthetic resin.

[0025] The collision energy-absorbing object 4 consists of bottom blocks 6 which consist of elastic material, such as foaming resin or rubber, successive installation arrangement is suitably carried out at equal intervals at the cross direction at the cross direction of a front bumper 1 on abbreviation the bottom block 5 which extends on the whole and this bottom block 5, bend in the cross direction, respectively, and consist of two or more deformable segregants 7.

[0026] It has fabricated [the bottom block 5 and one] shaping 7, i.e., a segregant, and a base 9 for this bottom block 6 to the bottom block 5 at one while it forms a slit 8 in the vertical direction, forms the above-mentioned segregants 7 successively to the hind base 9 at one and having fabricated it, if this operation gestalt has the bottom block 6.

[0027] Moreover, a slant face 10 is established in the side of the point of each segregant 7 of the bottom block 6, and the gap between the points of each adjoining segregants 7 and 7 is expanded.

[0028] Although the slant face 10 of the point side of said segregant 7 fabricates the point of this segregant 7 to Yamagata, plane 2 equilateral triangle, and has formed it in the both-sides side of the point of this segregant 7, with this operation gestalt, it is fabricated to a plane right triangle, and you may make it form a slant face 10 in one side of the point of a segregant 7 with it.

[0029] Therefore, the bottom block 6 which was formed on the bottom block 5 of the collision energy-absorbing object 4 arranged between the anterior part of the bumper armature 2, and bumper FEISHA 3 according to the structure of this operation gestalt Since successive installation arrangement of two or more segregants 7 is carried out at equal intervals suitably at the cross direction, and each segregant 7 bends in the cross direction, respectively and is made into deformable structure, If the collision experiment by the impaotor F of a pedestrian's leg model is conducted as shown in (**) of drawing 4 when a front bumper 1 collides with a pedestrian's leg for example, (only a collision energy-absorbing object is shown for convenience by a diagram) The segregants 7 and 7 which adjoin as the portion corresponding to this impaotor F shows to (b) of this drawing bend and deform in the direction estranged mutually to the cross direction, and penetration of these segregants 7 and the impaotor F of a between [seven] is permitted. The reaction force of the bottom block 6 is suppressed small as much as possible, and only the bottom block 5 carries out a compression set, and comes to absorb collision energy.

[0030] Therefore, the standup of the initial load of a collision is suppressed low, the same collision energy-absorbing property as the case where a collision energy-absorbing object is arranged only in the interior bottom of a front bumper 1 is acquired, and a pedestrian's leg can be protected safely.

[0031] Next, when the time of the collision of the opposite wall, pair vehicles, etc. of vehicles

was considered and it collides in parallel with the bodies M, such as a wall; as a front bumper 1 shows drawing 5, for example (the case of only a collision energy-absorbing object is shown for convenience also in this drawing). If impacting vehicle force inputs into the large area of the front face of bumper FEISHA 3, as shown in (b) from (b) of drawing 5, it will come to carry out the compression set also of each segregant 7 of the bottom block 6 to a cross direction with the bottom block 5 of the collision energy-absorbing object 4. Consequently, since collision energy is absorbed with these bottom block 5 and the bottom block 6 while enlarging the standup of the initial load of a collision, the amount of collision energy-absorbing can be increased and the body and both the collision body M can be protected.

[0032] Here, especially, with this operation gestalt, this point is fabricated to plane Yamagata, a slant face 10 is formed, and since the gap between each adjoining segregant 7 and 7 is expanded widely as much as possible, the segregant 7 of this leg at the time of a pedestrian's leg protective action and penetration of a between [seven] can be performed smoothly, can make reaction force still smaller, and can raise safety to the point side of each segregant 7 of said bottom block 6.

[0033] Moreover, since the slit 8 of the vertical direction is formed in the bottom block 6, it forms successively to the hind base 9 at one, successive installation arrangement is carried out tidily and each segregants 7 and 7 have moreover fabricated this bottom block 6 to the bottom block 5 and one, as well as the ability to constitute the collision energy-absorbing object 4 easily, components mark, an activity man day with a group, etc. do not increase, and they can be advantageously obtained in cost.

[0034] In addition, although the bottom block 6 which consists of a base 9 and two or more segregants 7 is the bottom block 5 and really fabricated with said operation gestalt Or it welds, and it unifies and you may make it arrange. this bottom block 6 — another object shaping — carrying out — the bottom block 5 top — slide contact arrangement — carrying out — or adhesion — or in fabricating a segregant 7 according to an individual, fixing on the bottom block 5, being able to carry out successive installation arrangement and carrying out another object shaping of the bottom block 6 and the bottom block 5 in this way A collision energy-absorbing property is tunable to arbitration with selection of each spring material and foaming density.

[0035] Moreover, although the point of each segregant 7 of the bottom block 6 is fabricated to plane Yamagata with said operation gestalt and the slant face 10 is formed in this point side with it In addition, as shown in drawing 6, fabricate the point of each segregant 7 in the shape of a plane circle, and a slant face 10 is formed in the both-sides side of this point. You may make it expand the gap between the points of the adjoining segregants 7 and 7, and the penetration guide of the leg can be smoothly carried out to between the adjoining segregant 7 and 7 even in this case.

[0036] Drawing 7 shows the case where formed the slit 11, and each segregant 7 of the bottom block 6 and the bottom block 5 are estranged and constituted in the vertical direction, according to this operation gestalt, can make the bending deformation to the cross direction of the segregants 7 and 7 at the time of a pedestrian's leg protective action able to perform freely, and can make the leg advance more smoothly in the structure of the 1st operation gestalt shown in said drawing 1-5.

[0037] It forms successively through 12 and the case where it constitutes is shown. the structure of the 1st operation gestalt which showed drawing 8 in said drawing 1-5 — setting — each segregant 7 of the bottom block 6, and the bottom block 5 — the cervix of thin meat — According to this operation gestalt, at the time of a pedestrian's leg protective action the cervix of thin meat — 12 is flexible — at the time of the collision of an opposite wall, pair vehicles, etc., while it can fall and deformation can be made to perform freely bending deformation to the cross direction of segregants 7 and 7 a segregant 7 — a cervix — since it has formed successively to the bottom block 5 through 12, the tip side of this segregant 7 curves upwards, and cannot escape, a compression set can be carried out to a cross direction proper, and a collision energy-absorbing operation can be made to perform

2004年 2月20日 10時21分

JSP 鹿沼研究所 特許部
JSP カヌマケンキュウジョウ

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DESCRIPTION OF DRAWINGS

[Brief Description of the Drawings]

[Drawing 1] The cross section equivalent to the A-A line of drawing 3 which shows the 1st operation gestalt of this invention.

[Drawing 2] The cross section equivalent to the B-B line of drawing 3.

[Drawing 3] The perspective diagram of the collision energy-absorbing object used for the 1st operation gestalt of this invention.

[Drawing 4] With the plan explaining the operation at the time of leg protection of the 1st operation gestalt of this invention, as for (b), (b) shows the deformation condition of a segregant for segregant's deformation before.

[Drawing 5] With the plan explaining the operation at the time of the collision for a wall of the 1st operation gestalt of this invention, as for (b), (b) shows the deformation condition of a segregant for segregant's deformation before.

[Drawing 6] The perspective diagram of the collision energy-absorbing object of the 2nd operation gestalt of this invention.

[Drawing 7] The cross section showing the 3rd operation gestalt of this invention.

[Drawing 8] Front view of the collision energy-absorbing object of the 4th operation gestalt of this invention.

[Description of Notations]

- 1 Bumper
- 2 Bumper FEISHA
- 3 Bumper Armature
- 4 Collision Energy-absorbing Object
- 5 Bottom Block
- 6 Bottom Block
- 7 Segregant
- 8 11 Slit
- 10 Slant Face
- 12 Cervix

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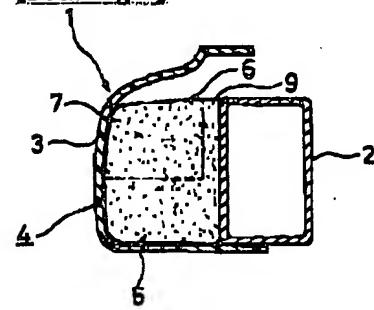
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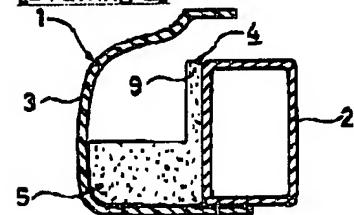
DRAWINGS

[Drawing 1]

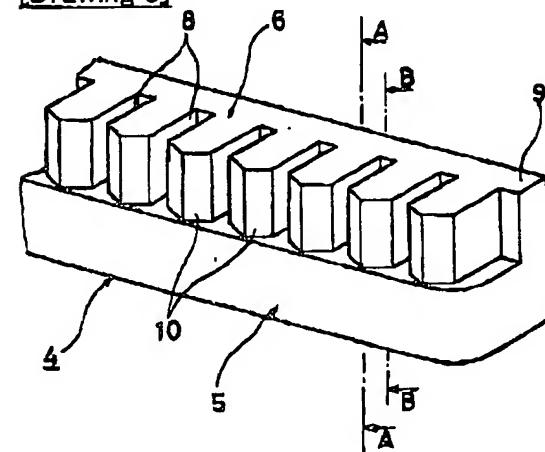


1...パン/バー
2...パン/バーーアーマチュア
3...パン/バーフェイシヤ
4...断熱エネルギー吸収体
5...下側ブロック
6...上側ブロック
7...分離体
8...スリット
10...側面
11...スリット
12...端部

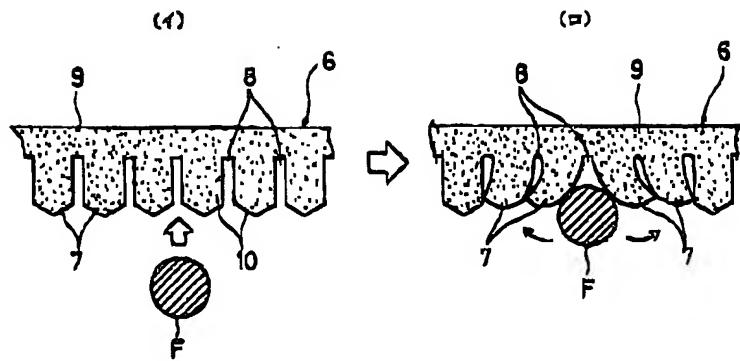
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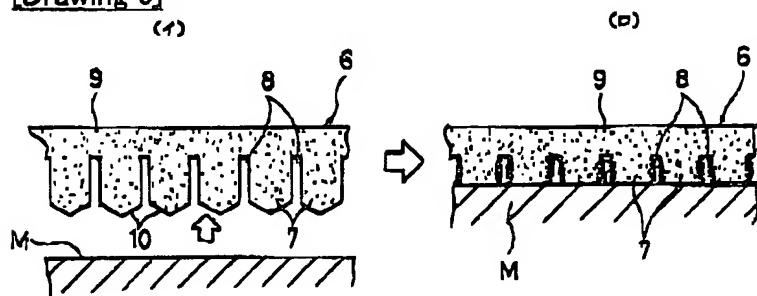
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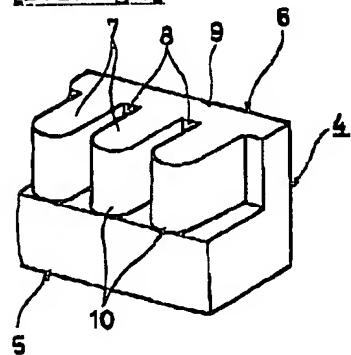
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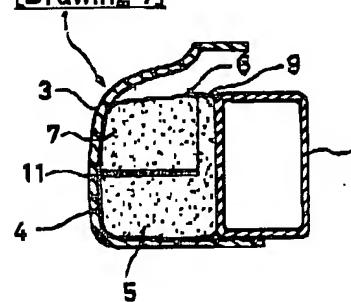
[Drawing 5]



[Drawing 6]



[Drawing 7]



[Drawing 8]

